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FOREIGN TECHNOLOGY DIVISION

METHOD OF OBTAINING DERIVATIVES OF 3,5-DINITRO-1,2,4-TRIAZOLE

by

T. P. Kofman, M. S. Pevzner and V. I. Manuylova

EDITED TRANSLATION

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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere. When written as ё in Russian, transliterate as yë or ë. The use of diacritical marks is preferred, but such marks may be omitted when expediency dictates.

GREEK ALPHABET

Alpha	A	α	ϰ	Nu	N	ν	
Beta	B	β		Xi	Ξ	ξ	
Gamma	Γ	γ		Omicron	O	o	
Delta	Δ	δ		Pi	Π	π	
Epsilon	E	ε	ϵ	Rho	P	ρ	ϱ
Zeta	Z	ζ		Sigma	Σ	σ	ς
Eta	H	η		Tau	T	τ	
Theta	Θ	θ	ϑ	Upsilon	T	υ	
Iota	I	ι		Phi	Φ	φ	ϕ
Kappa	K	ϰ	κ	Chi	X	χ	
Lambda	Λ	λ		Psi	Ψ	ψ	
Mu	M	μ		Omega	Ω	ω	

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English
sin	sin
cos	cos
tg	tan
ctg	cot
sec	sec
cosec	csc
sh	sinh
ch	cosh
th	tanh
cth	coth
sch	sech
csch	csch
arc sin	$\sin^{-1}$
arc cos	$\cos^{-1}$
arc tg	$\tan^{-1}$
arc ctg	$\cot^{-1}$
arc sec	$\sec^{-1}$
arc cosec	$\csc^{-1}$
arc sh	$\sinh^{-1}$
arc ch	$\cosh^{-1}$
arc th	$\tanh^{-1}$
arc cth	$\coth^{-1}$
arc sch	sech^{-1}
arc csch	csch^{-1}
rot	curl
lg	log

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(54) METHOD OF OBTAINING DERIVATIVES OF 3,5-DINITRO-1,2,4-TRIAZOLE

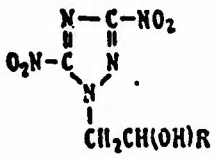
T.P. Kofman, M.S. Pevzner and V.I. Manuylova

Leningrad Order of the Labor Red Banner Technological Institute im. Lensovet

This invention concerns the method of obtaining new compounds, precisely, derivatives of 3,5-dinitro-1,2,4-triazole, which can be used as semifinished products for the synthesis of compounds of various classes, for example, acetals, ketones.

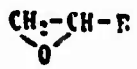
We already have a method for the alkylation of nitrogen-containing heterocyclic compounds, for example, imidazoles, α-oxides with the formation of secondary alcohols.

We present a method, based on the reaction known in organic chemistry, for obtaining new compounds, derivatives of 3,5-dinitro-1,2,4-triazole of general formula I



where R - hydrogen, the lowest alkyl, $-CH_2OH-$ or CH_2OCH_3-group,

including the fact that 3,5-dinitro-1,2,4-triazole is subjected to action with a compound of general formula II:



where R has the indicated values,

with subsequent release of the end product by the known method.

The reaction occurs at temperature 0-40°C in aprotic polar solvents, for example, ether, acetone, acetonitrile.

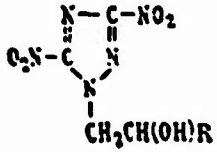
Example: 1-(2-hydroxyethyl)-3,5-dinitro-1,2,4-triazole (I).

To 3 g (0.0195 mole) of 3,5-dinitro-1,2,4-triazole in 100 ml of ether, while stirring, we add 2.9 ml (0.0585 mole) ethylene oxide at temperature 0-5°C. The reaction mass is maintained at room temperature for 36-48 hours, controlling the pH medium, is washed with water and the ether solution and dried over calcined magnesium sulfate. Having remained after the removal of the solvent, the oil gradually crystallizes. The analytical data is given in the Table.

The compounds II-IV are synthesized similarly; their data is given in the Table.

Purpose of the invention

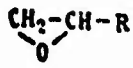
The method for obtaining derivatives of 3,5-dinitro-1,2,4-triazole of general formula I



where R - hydrogen or the lowest alkyl, or $-CH_2OH-$ or CH_2OCH_3- group,

differs because the 3,5-dinitro-1,2,4-triazole is subjected

to action with a compound of general formual II



where R has the indicated values,

in aprotic polar solvents with subsequent release of the end product by the known method.

*1-(2-Hydroxyalkyl)-3,5-dinitro-1,2,4-triazole

Compound	Epoxy used in the reaction	Time of contact of the reagents, hour	Yield	T. melt., °C	Solvent for crystallization	Analysis						
						Found, %			Empirical formula	Calculated, %		
						C	H	N		C	H	N
I	Ethylene oxide	48	36	58	Dichloro-ethane-chloroform 1:2	24.18 24.11	2.24 2.19	34.65 34.90	$C_4H_5N_5O_5$	23.62	2.46	34.50
II	Propylene oxide	72	94	101	Chloroform	28.42 28.95	3.22 2.94	32.86 32.71	$C_5H_7N_5O_5$	27.65	3.22	32.24
III	Glycidol	112	45.5	105	Dichloro-ethane-chloroform 2:1	26.23 26.37	2.77 2.83	29.97 30.07	$C_5H_7N_5O_6$	25.75	3.00	30.04
IV	Methoxy-glycide	72	77.5	70	Carbon Tetrachloride	28.92 28.95	3.48 3.67	28.05 28.26	$C_6H_9N_5O_6$	29.15	3.64	28.34

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